



**PRELIMINARY CLOSE OUT REPORT
VERTAC SUPERFUND SITE
JACKSONVILLE, ARKANSAS**

I. INTRODUCTION

A) General

This Preliminary Close-Out Report (PCOR) for the Vertac, Incorporated, Superfund Site (site) documents that the U.S. Environmental Protection Agency (EPA) and the Arkansas Department of Pollution Control and Ecology (ADPC&E) have completed construction activities for the Off-Site Areas Operable Unit (Off-Site OU), the On-Site Above Ground Operable Unit (OU1), the Soils Foundations, and Underground Utilities Operable Unit (OU2), and the Ground Water Operable Unit (OU3) as well as the final completion of a lengthy removal action which included the on-site incineration of some 26,000 drums of 2,4-D still bottoms waste, in accordance with OSWER Directive 9320.2-09. The EPA and the State of Arkansas ("the State") conducted the pre-final construction inspection on May 7, 1998. The final inspection was conducted on June 24, 1998, by both parties, for all aspects of site remediation. The EPA and the State have determined that Hercules, Incorporated, (the site Potentially Responsible Party) has implemented four remedies by utilizing their construction contractors (ENSR, Inc. and Associated Environmental Industries - AEI). ENSR constructed the remedy in accordance with remedial design (RD) plans and specifications and three Records of Decision (RODs) for the site. AEI performed the drilling and groundwater well installation in accordance with RD plans and specifications, and the ROD for OU3. All field construction site activities for the remedial actions have been completed, except long-term Operations and Maintenance (O&M) activities, that will be conducted indefinitely. The O&M activities include the maintenance of a leachate collection system (French Drain), operation of the groundwater extraction system, and treatment of the extracted groundwater and collected leachate, as well as the performance of any other maintenance items (such as mowing, ground water monitoring, and building and fence maintenance as necessary) to comply with the requirements of the RODs.

II. SUMMARY OF SITE CONDITIONS

A) Background

The Vertac, Incorporated, Superfund Site is approximately 193 acres in size and is located on Marshall Road in Jacksonville, Pulaski County, Arkansas, as shown in Figure 1. Jacksonville is about 15 miles northeast of the State Capital, Little Rock. Approximately 1,000 residents live within one mile of the site with residential areas bordering the entire east and south sides. The

west and northern sides of the site are bounded by an industrial area and the Little Rock Air Force Base, respectively.

The site consists of two parcels of land (Parcel 1 and Parcel 2) that were acquired at different times during plant operations (Figure 2). Parcel 1 (the southern acreage), which contains the central process area, is approximately 93 acres and has been in nearly continuous industrial use since 1948. Parcel 2, which is approximately 100 additional acres to the north, was purchased by Vertac Chemical Corporation (Vertac) in 1978 but was never used in the herbicides formulations operation. In 1979, the 2,4,5-T storage shed was built adjacent to the old Regina paint building, which was demolished and disposed in the on-site landfill in fall 1997. Parcel 2 has never contained production facilities, but constructed four large storage sheds to house the 2,4-D, and 2,4,5-T waste prior to incineration, and to store the salt and ash residue after incineration. An incinerator constructed under the contract to the ADPC&E to burn drummed waste was also located in the northern part of Parcel 1, but was dismantled by Hercules, Inc. (Hercules) during fall 1997.

Topographically, the land has moderate relief, sloping from about 310 feet above mean sea level (MSL) in the north to approximately 260 feet near the southwestern corner. The central process area is located on a south plunging topographic nose bounded by Rocky Branch Creek on the west and Marshall Road on the east. Land on the western side of Rocky Branch Creek has not been used for manufacturing and is topographically separated from the central process plant area by the creek. This area west of Rocky Branch Creek is the location of the new Subtitle C landfill (containment/consolidation vault). Land on the eastern side of Marshall Road has not been used for manufacturing and is geographically separated from the central process plant area by Marshall Road. Land on the northern part of the site has not been used for herbicide manufacture and is generally up slope from the central process plant area.

B) History

The first facilities on the site were constructed by the U.S. Government in the 1930's and 1940's. These facilities were part of a munitions complex that extended beyond the present site boundaries. Little is known about the operations that occurred during that time period. In 1948, the Reasor-Hill Company purchased the property and converted the operations to manufacture insecticides such as DDT, aldrin, dieldrin, and toxaphene. During the 1950's, Reasor-Hill manufactured herbicides such as 2,4-dichlorophenoxyacetic acid (2,4-D), 2,4,5-trichlorophenoxyacetic acid (2,4,5,-T), and 2,4,5-trichlorophenoxypropionic acid (2,4,5,-TP), which is also called Silvex. Drums of organic material were

stacked in an open field immediately southwest of the production area, and untreated process water was discharged from the western end of the plant to Rocky Branch Creek.

Hercules Powder Company, now known as Hercules, Inc., purchased the Reasor-Hill property and plant in 1961 and continued to manufacture and formulate herbicides. The drums that were in the open area southwest of the central process area were buried in what is now referred to as the Reasor-Hill Landfill. From 1964 to 1968, Hercules produced the herbicide Agent Orange, a mixture of equal parts of 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) and 2,4-dichlorophenoxyacetic acid (2,4-D). Hercules discontinued operations at the site in 1971.

From 1971 to 1976, Hercules leased the plant site to Transvaal, Inc. (Transvaal), a predecessor company of Vertac. Transvaal resumed production of 2,4-D and intermittently produced 2,4,5-T. Organic wastes from these manufacturing processes were stored and then buried by Hercules on the site in what is now referred to as the North Landfill area. Transvaal purchased the property and plant from Hercules in 1976. In 1978, Transvaal underwent a Chapter XI bankruptcy reorganization and ownership of the site was transferred to the new company, Vertac Chemical Corporation (Vertac), which is the present owner.

Vertac operated the plant until 1986. On January 31, 1987, Vertac abandoned the site and declared bankruptcy, leaving approximately 29,000 drums of 2,4-D and 2,4,5-T wastes. Many of these drums were corroded and leaking. At that time, EPA initiated an emergency removal action to stabilize and secure the site.

At the time operations were shut down, Vertac "mothballed" the plant. Mothballing involved flushing process lines and draining several of the process vessels. Continuing activities at the site include operation of the newly-installed ground water extraction system in the eastern portion of the site, as well as the operation of an on-site wastewater treatment plant by Hercules, Inc. The treatment plant processes ground water collected in French drains constructed downgradient (south and west) of the old waste burial areas, and groundwater pumped from the extraction system from the eastern portion of the site. This water is treated on-site and discharged directly into Rocky Branch Creek (after meeting discharge limits established by ADPC&E).

The site was added to the National Priorities List (NPL) of hazardous waste sites in 1982. Once the site was placed on the NPL, money available from the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), commonly called Superfund, 42 U.S.C. § 9601 *et seq.*, could be used to investigate and study the problems at the site and find ways to correct them to protect the public health and the environment.

III. Cleanup Phases

The following is a description of the six cleanup phases or operable units that have been completed at the site. Collectively, the completion of all six phases has addressed all environmental risks posed by the site.

Phase 1 "THE VERTAC REMEDY": ADPC&E issued an order in 1979 that required Vertac to improve its hazardous waste practices, and in 1980 EPA and ADPC&E jointly filed suit in Federal district court against Vertac and Hercules, Inc. A Consent Decree entered into by EPA, ADPC&E, Vertac, and Hercules in January 1982 required an independent consultant to assess the conditions of on-site wastes and to develop a proposed disposal method for the wastes. The proposal, called the "Vertac Remedy," was deemed by EPA to be unsatisfactory, since it resulted in leaving hazardous waste buried in unlined pits, and EPA returned to court in early 1984 for a resolution. The court decided in favor of the proposed remedy, which was implemented in summer 1984 and completed in July 1986.

As part of the remedy, the Vertac plant cooling water pond and the equalization basin were closed and sediments from these units were removed and "contained" or landfilled within an area where earlier operators had buried drums of waste. This landfilled sediment is commonly referred to as "Mount Vertac." The burial area was capped and a French drain and leachate collection system were installed around the burial area. The contaminated leachate is pumped from a series of sumps and treated in the on-site wastewater treatment plant, and subsequently discharged directly into Rocky Branch Creek (after meeting discharge limits established by ADPC&E). Ground water monitoring wells were also installed, and a ground water monitoring program was initiated.

Phase 2 "DRUMMED WASTE INCINERATION": In 1989, ADPC&E signed a contract to have approximately 29,000 barrels of 2,4-D and 2,4,5-T herbicide still bottom wastes incinerated on-site. Wastes from the production of 2,4,5-T at this site have been found to contain up to 50 parts per million (ppm) of dioxin, while wastes from the production of 2,4-D generally contain dioxin in the low parts per billion (ppb) range. All drummed wastes were treated as F-listed (dioxin containing) wastes pursuant to the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6901 et seq.

To accomplish this incineration, the State used funds from the trust fund that was established when Vertac went bankrupt. Incineration of these wastes began in fall 1990. In June 1993, funding for the project was depleted, and EPA assumed immediate responsibility for incinerating the remaining drums as a time-critical removal action undertaken pursuant to CERCLA Section 104, 42 U.S.C. § 9604. In late September 1994, the incineration of 25,179 drums of dioxin-contaminated 2,4-D waste was completed at

the site. In July 1994, EPA announced that it would pursue the off-site incineration of approximately 3,200 drums of dioxin containing 2,4,5-T waste located at the Vertac site. On November 9, 1994, a contract was signed between the APTUS commercial incineration facility in Coffeyville, Kansas, and EPA's prime contractor URS Consultants, to accept the Vertac drummed T-waste material. The first shipment of T-waste went to APTUS in November 1994, and the last shipment was sent off-site on March 29, 1996.

Phase 3 "VERTAC OFF-SITE AREAS": The Record of Decision (ROD) for the Off-Site Areas Operable Unit was signed on September 27, 1990, to address the cleanup of contiguous off-site areas that were contaminated as a result of untreated and partially treated surface and underground discharges of plant wastewater and other releases. Elements of this operable unit include an active sewer interceptor and an abandoned sewer interceptor, portions of an old abandoned trickling filter wastewater treatment plant, an active West Wastewater Treatment Plant, and the Rocky Branch Creek flood plain. The selected remedy called for removing sediments from the active sewer interceptor, installing pipe liners in the clean sewer, filling the abandoned interceptor with grout, and removing sludge from the sludge digester in the old wastewater treatment plant. Sludge drying beds in the old wastewater treatment plant were capped with one foot of clean soil and the aeration basin in the old wastewater treatment plant was drained and demolished. All of this contaminated material was excavated and stored at the Vertac site in 1995.

As EPA proceeded with overall site remediation, it concluded that it was appropriate to defer the disposal of the contaminated soil and debris described above, to make the disposal of this material consistent with the disposal of on-site soils and debris. All contaminated soils, sediments, and sludge described above were excavated and stored at the Vertac site, then disposed in fall 1997, in the on-site Subtitle C containment vault constructed within the western portion of the site. Flood plain soils along Rocky Branch Creek contaminated with dioxin in excess of one ppb were also excavated and disposed in the on-site Subtitle C containment vault in summer 1997. The final aspect of this Operable Unit is the monitoring of fish in Rocky Branch Creek and Bayou Meto for dioxin. This monitoring will ensure that dioxin levels in fish tissue continue to decrease, and will continue indefinitely.

Phase 4 "ON-SITE ABOVE GROUND MEDIA" (Operable Unit #1): The ROD for the above-ground media was signed on June 30, 1993. The above-ground media include buildings, process equipment, leftover chemicals in the process vessels, spent activated carbon, shredded trash and pallets, and miscellaneous drummed wastes at the site. The selected remedy consisted of: (1) On-site incineration of F-listed process vessel contents, spent carbon, shredded trash and

pallets, and miscellaneous drummed wastes; (2) off-site incineration of PCB transformer oils and non- F-listed process vessel contents; (3) recycle/reuse of decontaminated process equipment to the maximum extent practicable; (4) on-site consolidation of debris resulting from demolition of buildings and equipment that cannot be recycled/reused in a RCRA subtitle C landfill; (5) the deferral of a decision on the treatment of approximately 2,770 cubic yards of TCDD-contaminated residential soils that Hercules had excavated as a removal action in 1988 from contiguous residential areas south of the site; (6) disposal of treatment residues consistent with disposal of ash and salt that was generated by the incineration of drummed wastes at the site; and, (7) the construction of a RCRA Subtitle C landfill on-site.

A Unilateral Administrative Order (UAO) was issued to Hercules, Inc., in March 1994 requiring it to perform the remedial design and remedial action under the ROD for OU1. Hercules' remedial design work plan expressed interest in pursuing off-site incineration as a means to perform some actions under the ROD. Subsequently, an Explanation of Significant Difference (ESD) was issued in May 1995 by EPA to allow such off-site incineration. Hercules later signed a contract with APTUS, an off-site commercial hazardous waste incineration facility. Therefore, Hercules has completed off-site incineration of F-listed and non- F-listed liquids and solids that were present in the process vessels (and all other materials within component #1 of the selected remedy described above). Hercules completed all aspects of OU1 in May 1998.

Phase 5 "SOILS AND UNDERGROUND UTILITIES" (Operable Unit 2): The ROD for Operable Unit 2 (OU2) media was signed on September 17, 1996, and addressed surface and subsurface soils, underground utilities, foundations, curbs and pads. The selected remedy consisted of: 1) excavation and disposal in the on-site Subtitle C consolidation/containment unit of all soils with dioxin concentrations at or above the action level of 5 ppb, and subsequent backfill with clean soil; 2) excavation and off-site incineration of the crystalline tetrachlorobenzene (TCB) and TCB-associated spill soils where the TCB concentrations exceed a 500 ppm health-based action level; 3) cleaning of the chemical sewer lines to remove solids and backfilling with grout; and, 4) scarification of foundations and curbs to remove visible staining, and the application of epoxy sealant where staining persisted, and cover with adequate soil (typically between 18 and 24 inches) to support a vegetative cover, and contoured to prevent erosion and ponding of storm water.

In conjunction with an amendment to the 1990 Off-Site Areas ROD, the ROD for OU2 addressed media originally intended to be addressed by the 1990 Off-Site Areas ROD, which consist of contiguous soils from the Rocky Branch Creek flood plain, sludge

from the Old Sewage Treatment Plant sludge digester, and the sediment from the associated interceptor lines (which are considered to be contiguous to the site due to the continuous connection to the site via the sewer interceptor). Finally, the ROD for OU2 also addressed bagged soils Hercules had excavated from contiguous residential yards in 1988 as part of a removal action, the treatment of which EPA deferred in the OU1 ROD.

Because of the similarity of OU2 media to the media from the 1990 Off-Site Areas ROD and contiguous off-site residential soils Hercules had excavated during a 1990 removal action, EPA chose to address them in the OU2 ROD so that similar waste materials associated with the Vertac site would be treated in a consistent manner. The final disposition of these materials was described in Phases 3 and 4 above. All remedial action components of OU2 were accomplished in 1997.

Phase 6 "GROUND WATER" (Operable Unit #3):

The ROD for the Groundwater Operable Unit (OU3) was signed on September 17, 1996. The selected remedy consisted of the installation of extraction wells in the Central Process Area to hydraulically control the off-site migration of contaminated ground water to the east, the continued operation of the existing French drain system to impede ground water contaminant migration to the south and west, and the proposed use of the Reasor-Hill well and MW-92 as additional extraction wells. The ROD for OU3 also invoked a "Technical Impracticability Waiver" since it is technically impractical to extract Non Aqueous Phase Liquids (NAPLs) from a tilted, fractured bedrock system. Specifically, available technology has not been able to meet the Maximum Contaminant Levels (MCL) set out at 40 CFR Sections 141.11-26, with a typical "pump and treat" system. Therefore, the selected remedy results in the containment of contaminated ground water.

IV. Construction Activities

A) Removal Construction Activities

In 1988, ADPC&E contracted for the incineration of the drummed waste, using a \$10.7 million combined trust fund and letter of credit obtained from Vertac during bankruptcy litigation. A contract for the incineration of the drummed waste was signed in 1989 between ADPC&E and Vertac Site Contractors (VSC). VSC is a joint venture of MRK Incineration and Morrison-Knudson Environmental Services. In January 1992, ADPC&E approved the VSC trial burn and production incineration began. Because of the difficulty in handling the Vertac drummed waste material, incineration operations took longer than originally anticipated. In May 1993, the trust fund money had been expended with approximately 50 percent of the waste destroyed under the State's

contract. In June 1993, EPA took over the incineration operation and completed the incineration of the D-waste drums in September 1994. The EPA contracted for the off-site incineration of the remaining 3,100 drums of T-waste. Shipments of T-waste to the APTUS commercial hazardous waste incineration facility, located in Coffeyville, Kansas, concluded on March 29, 1996.

On July 18, 1996, the Regional Administrator for EPA Region 6 executed a Non-Time Critical Removal Action Memorandum that concluded the on-site incinerator support activities associated with the on-site D-waste incineration. That Action Memorandum authorized the off-site disposal of approximately 34,000 drums of salts (and the associated pallets) that were generated during the on-site incineration of D-wastes, and it authorized the on-site disposal within the RCRA Subtitle C hazardous waste landfill of both 10,000 lightly contaminated pallets used to store drummed waste materials and of 6,300 drums of incinerator ash (and their associated pallets). In that Action Memorandum, the Regional Administrator also granted a variance from the RCRA Land Disposal Restriction (LDR) treatment standard applicable to dioxin-containing wastes found at 40 CFR § 268.31. Specifically, the Regional Administrator approved a treatability variance for the disposal of dioxin-contaminated wastes within the on-site RCRA Subtitle C landfill of 5 ppb from the LDR standard of 1 ppb pursuant to the procedures set out at 40 CFR § 268.44. Therefore, the LDR dioxin treatment standard for the on-site disposal of dioxin contaminated waste within the on-site RCRA Subtitle C hazardous waste landfill was increased to 5 ppb. See July 18, 1996, Non-Time Critical Action Memorandum in Administrative Record for more details.

Also, on December 31, 1996, the EPA issued a UAO to Hercules for the "Dismantling, Decontamination, and Consolidation within the On-Site Hazardous Waste Landfill of the On-Site Incinerator and Associated Structures and Debris, and Incinerator Ash and Pallets" at the Vertac, Inc. Superfund Site. This action could be implemented since Hercules had previously signed an agreement with VSC to "accept deed" for the hazardous waste incinerator facility (IF) for a release of future liability. The IF dismantlement, decontamination, and consolidation of unuseable components, as well as the disposal (consolidation) of the incinerator ash was completed in fall 1997/winter 1998. This action concluded the Vertac removal construction activities.

B) Remedial Construction Activities

Off-Site Areas Operable Unit

The EPA, with concurrence from the State of Arkansas, signed the Record of Decision (ROD) on September 27, 1990, for the Off-Site Areas Operable Unit. The major components of the originally selected remedy for the Off-Site Areas Operable Unit include:

- Sewage Collection Lines -- Sediments would be removed from the active sewage collection lines between the Vertac plant site and the West Wastewater Treatment Plant and incinerated on-site. Pipe liners would be installed in the cleaned sewer lines. The abandoned line would be filled with grout to reduce the migration of contaminants in the line.

- Old Sewage Treatment Plant -- The sludge would be removed from the sludge digester and incinerated on-site. The sludge drying beds would be capped with one foot of clean soil. Accumulated water in the treatment units would be removed, treated and discharged, and the treatment units would be demolished and capped with one foot of clean soil. A notice would be placed in the deed recommending that the Old Sewage Treatment Plant site zoning remain commercial/industrial and access be restricted.

- West Wastewater Treatment Plant -- The aeration basin would be drained, the dikes demolished, and the entire basin capped with one foot of clean soil. A notice would be placed in the deed recommending that the West Wastewater Treatment Plant site zoning remain commercial/industrial and access be restricted.

- Rocky Branch Creek and Bayou Meto Flood Plain -- In order to minimize ecological damage to the floodplain and to the downstream areas, the floodplain areas that are currently residentially zoned will be resampled and only those areas with actual 2,3,7,8 tetrachloro-dibenzo-p-dioxin (2,3,7,8-TCDD) levels greater than 1.0 ppb will be removed and incinerated onsite.

- Rocky Branch Creek and Bayou Meto - Monitor fish in these streams for dioxin and continue ban on commercial fishing and advisory discouraging sport fishing as long as fish fillet tissue dioxin levels are above Food and Drug Administration alert level.

Under the terms of a Unilateral Administrative Order (UAO) issued pursuant to CERCLA Section 106, 42 U.S.C. § 9606, in July 1993, Hercules completed performance of the 1990 ROD's off-site remedial actions except for the excavation of the Rocky Branch Creek flood plain soils and the on-site incineration of removed sediments from sewage collection lines and sludge removed from the digester. The sediments and sludge were removed in 1995 and temporarily stored on-site. Subsequent to issuing the 1990 Off-Site Areas ROD, EPA determined that the off-site soils and debris are similar in their physical characteristics and in the nature and extent of contamination to on-site soils and debris. For that reason, EPA concluded that it was appropriate to defer the disposal of the off-site soils and debris to ensure that such disposal would be consistent with that of the on-site soils and debris.

Therefore, on September 17, 1996, the Regional Administrator signed an Amendment to the 1990 Off-Site Areas ROD for the following reasons:

- 1) the on-site incinerator at Vertac was permanently shut down on January 31, 1995, and became unavailable to incinerate wastes from Vertac off-site areas;
- 2) citizens of Jacksonville, Arkansas where the Vertac Superfund site is located, had expressed opposition to any further on-site incineration; and,
- 3) similar site media, such as contaminated soils, sediments, and sludges, whether they are present on- or off-site, should be disposed in a consistent manner; those materials constitute low level threat media, for which containment, versus treatment, is an appropriate means of disposition. See Section 300.430(a)(iii)(B) of the National Contingency Plan (NCP), 40 CFR § 300.430(a)(iii)(B).

The contaminated soil along the floodplain of Rocky Branch Creek was excavated and disposed in the on-site Subtitle C containment cell (vault) in summer 1997. All the temporarily stored contaminated soil, sediment and sludge from the old waste water treatment plants and sewage lines were disposed in the on-site Subtitle C containment cell in summer 1997. These remedial actions concluded all components of the Off-Site Areas Operable Unit.

On-Site Operable Unit #1 (Above Ground Media)

The EPA, with concurrence from the State of Arkansas, signed the ROD on June 30, 1993, for the On-Site Operable Unit #1 (Above Ground Media). The major components of the originally selected remedy for OUI include:

- on-site incineration of F-listed process vessel contents, shredded trash and pallets, and miscellaneous drummed wastes (except Remedial Investigation (RI) wastes such as used personal protective clothing and trash);
- off-site incineration of transformer PCB oils;
- on-site incineration and/or reactivation and reuse of spent carbon;
- if feasible, off-site treatment, disposal, or reuse of demonstrated non-F-listed process vessel contents (such as spent caustic, hydrochloric acid, kerosene/fuel oil, etc.) or on-site incineration;

- off-site recycle/reuse of decontaminated process equipment (such as tanks, structural steel, pumps, etc.), to the maximum extent practicable;
- on-site consolidation/containment of debris resulting from demolition of buildings (except the supervisor's office building, bagged soil storage building, and wastewater treatment plant building that would be left intact for continued use), and process equipment that is not practicable to be recycled/reused, and some containerized materials (RI wastes) in a RCRA Subtitle C landfill;
- treatment residues - Incinerator ash and salt disposal shall be consistent with the disposal of ash and salt generated by on-site incineration of drummed wastes that was in progress at the signing of the ROD. The EPA was in the process of selecting a disposal option for the ash and salt being generated at the Vertac facility; and,
- decontamination residues - On-site incineration of used solvents, filter spools, etc.; On-site treatment and discharge of contaminated water.

The EPA selected on-site incineration for F-listed wastes because, at the time of the public meeting concerning the proposed plan, and the writing of the ROD: (1) a viable off-site incinerator was not available for the incineration of F-listed dioxin wastes; (2) the cost of off-site incineration was estimated to be \$2,000 more per ton of waste; and, (3) CERCLA expressly contains a preference for on-site remedies.

Hercules later received bids from APTUS (an off-site incinerator located in Coffeyville, Kansas) and from Morrison Knudson Corporation (owner of the Vertac on-site incinerator) for the incineration of Vertac OUI media. These bids indicated that incineration costs were about the same, whether it was conducted on-site or off-site. Hercules also notified EPA that its preference was to use the APTUS incinerator. Additionally, the citizens of Jacksonville, Arkansas, had on several occasions informed EPA that they would prefer an off-site incineration remedy for the wastes at the Vertac site. Therefore, the CERCLA preference for on-site remedies in this case was overridden by the community's desire to incinerate the waste at an off-site location.

Consequently, on May 25, 1995, the Regional Administrator signed an Explanation of Significant Differences (ESD) which modified certain components of the selected remedy. The relative components of the original remedy that were impacted by the ESD are:

- on-Site incineration of F-listed process vessel contents, highly contaminated trash and pallets, and miscellaneous drummed wastes (except RI wastes);
- on-site incineration and/or reactivation and reuse of spent carbon; and
- on-site incineration of decontamination residues, such as used solvents or filter spools;

The modified components of the remedy are:

- on-Site or off-site incineration of F-listed process vessel contents, shredded trash and pallets, and miscellaneous drummed wastes (except RI wastes);
- on-site or off-site incineration and/or reactivation and reuse of spent carbon; and,
- on-site or off-site incineration of decontamination residues, such as used solvents or filter spools.

In 1995, Hercules elected to construct a new wastewater treatment facility due to the limited life of the old facility located in the center of the Central Process Area (CPA), and the demolition work necessary in the CPA. Consequently, Hercules began construction of the new treatment facility in late 1996, just south of the CPA, and began treating leachate in the new treatment facility in June 1997. All other construction activities necessary for the completion of all originally selected non-modified components, and modified components addressed in OU1 were completed in May 1998.

Operable Unit #2 (Soils, Foundations, and Underground Utilities)

The EPA, with concurrence from the State of Arkansas, signed the Record of Decision on September 17, 1996, for the Soils Operable Unit (OU2). The major components of OU2 include:

- excavation of all on-site soils with dioxin concentrations at or above the action level of 5 parts per billion (ppb) and disposal in the on-site landfill; and subsequent backfill with clean soil;
- excavation and off-site incineration of the crystalline TCB and TCB-associated spill soils where the TCB concentrations exceed a 500 parts per million (ppm) health-based action level; and subsequent backfill with clean soil;

- consolidation of approximately 2,770 cubic yards (4,155 tons) of dioxin-contaminated soils removed from residential yards in 1988, (the treatment of which was deferred in the OU1 ROD) into the on-site Subtitle C landfill;
- the excavation of 1 ppb or greater (approximately 4,100 cubic yards or 6,150 tons) dioxin-contaminated soils from along Rocky Branch Creek and consolidation of this material into the on-site Subtitle C landfill; and subsequent backfill with clean soil; this material was originally addressed in the Off-site Areas ROD, but the final disposition was amended in the 1996 Off-site Areas ROD amendment;
- consolidation of approximately 890 cubic yards (1,200 tons) of dioxin contaminated digester sludge, and approximately 2 cubic yards of dioxin contaminated sediment from the Old Sewage Treatment Plant and the interceptor lines, respectively, into the on-site Subtitle C landfill. These materials were also originally addressed in the Off-site Areas ROD, but the final disposition was amended in the 1996 Off-site Areas ROD amendment;
- the cleaning of underground chemical sewer lines to remove solids, and backfilling with grout; including the installation of cut-off barriers around various underground utility lines to prevent shallow water migration along these lines; and,
- the cleaning and surface scarification of foundations and curbs, and the subsequent cover with adequate soil to support a vegetative cover.

As a result of an Exposure Investigation (EI) that was finalized on August 11, 1997, and performed jointly by the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) and the Arkansas Department of Health (ARDOH), it was recommended that additional soil samples be taken from a residence where an occupant had been determined to have an elevated dioxin blood level. Soil samples taken by the ARDOH as part of the EI had detected dioxin (tetrachlorodibenzo-p-dioxin or TCDD) above the residential cleanup level of 1 ppb.

Two additional "rounds" of sampling performed by EPA, and one "round" of sampling performed by Hercules under Federal oversight later indicated that the TCDD contamination in the area of the original residence sampled was more widespread than the initial yard sampled. The TCDD concentrations in soil sampled from four original residences located in Jacksonville, Pulaski County, Arkansas, exceeded the 1 ppb residential action level.

Consequently, on January 12, 1998, the Regional Administrator signed an Explanation of Significant Differences which documented an alteration to the selected remedy under CERCLA in the ROD for OU2 of the Vertac Superfund Site. This significant difference was the additional consolidation of dioxin-contaminated residential soils from the Jacksonville Residential Areas Superfund Site ("JRA Site"), Jacksonville, Arkansas, in the on-site hazardous waste landfill that was constructed as part of OU1 for the Vertac Site. The JRA Site is located approximately 1000 feet east of the Vertac, Inc., Superfund Site in Jacksonville, Arkansas.

The mechanism for disposing of, or consolidating, the contaminated soil on the Vertac Site is the Area of Contamination (AOC) which simply states that if contamination is being consolidated within a CERCLA Area of Contamination and is not subject to treatment, then "placement" within the meaning of RCRA, does not occur, therefore the RCRA Land Disposal Restrictions (LDRs) required by 40 C.F.R. 268, do not apply. See 55 Fed. Reg. 8666, at 8758-60. In order to be consistent with the Vertac OU2 determination and given the site relationship factors noted above, for purposes of consolidation, the contaminated soil from the Jacksonville Residential Areas Superfund Site was considered part of the Vertac Site, and within the AOC. Therefore, this soil could, and appropriately was, consolidated within the on-site landfill or Consolidation/Containment Unit at the Vertac Site, which was part of the Vertac Site CERCLA remedial action. The construction activities for the JRA site were performed in winter and spring 1998, with the completion in May 1998. The construction activities eventually affected nine residences, and a portion of vacant property owned by Vertac east of Marshall Road. All construction activities necessary for the completion of the JRA site, and all construction activities addressed in OU2 were completed in May 1998.

Groundwater Operable Unit #3 (OU3)

The EPA, with concurrence from the State of Arkansas, signed the ROD on September 17, 1996, for the Groundwater Operable Unit (OU3). The major components of the selected remedy for OU3 include:

- the installation of extraction wells in the Central Process Area to hydraulically control the off-site migration of contaminated ground water to the east;
- the continued operation of the existing French drain system to impede ground water contaminant migration to the south and west; and
- the proposed use of the Reasor-Hill well and NW-92 as additional extraction wells.

During winter 1997-98, additional extraction wells and monitoring wells were installed in the area just east of the CPA, to result in an extraction system to achieve the containment of the contaminated ground water as selected in the ROD, and in accordance with the approved Remedial Action Work Plan. A "bail down" test was performed during the Remedial Design, after which it was concluded that the Reasor-Hill well was not a viable means for removal of NAPL from the bedrock; therefore it was abandoned. The existing monitoring wells MW-72 and MW-92 were reamed to become two new extraction wells, and three additional wells were installed for a total of five extraction wells. Six additional monitoring wells were installed for the monitoring system. All remedial action components of OU3 have been accomplished in winter 1997-98, except the final analyses of the pump tests and the final survey to delineate the final scheme of monitoring wells necessary for long-term O&M. O&M for this OU will include maintenance of pumps (or replacement as necessary), and plumbing and electrical improvements as needed. O&M for this OU will be necessary indefinitely.

V. DEMONSTRATION OF QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) FROM CLEANUP ACTIVITIES

The quality assurance/quality control (QA/QC) program for the Vertac project was conducted under three Project Quality Plans. First, all off-site work was conducted under the "Remedial Action Construction Quality Assurance Plan" prepared by Environmental Resources Management, Inc. (ERM) and dated July 29, 1994. Second, the construction work for OU1, OU2, and the IF dismantlement was conducted under the "Construction Quality Assurance Plan" prepared by ERM and dated May 8, 1997. Third, the construction work for OU3 was conducted under the "Construction Quality Assurance Plan" prepared by Randall L. Maud Associates, Inc. (Randall Maud) dated June 27, 1997. ENSR was the construction contractor for all work except the groundwater portion of site remediation. Associated Environmental Industries, Inc. (AEI) was the construction contractor (driller) for the OU3 work. The construction contractors were responsible for performance of the work according to the Remedial Action (RA) construction contract and as described on the design plans and specifications for the site. In addition to conducting oversight activities, the Project Site Manager (PSM) held informal meetings as needed (sometimes daily) with ENSR and AEI to ensure the construction activities were conducted in accordance with the QA/QC program. Hercules also held monthly progress meetings with the construction contractors, State representatives, U.S. Army Corps of Engineers representatives (the Government oversight representative conducting oversight under an Interagency Agreement), and EPA to assure alignment, review schedules, identify field problems, and develop corrective measures, as needed.

Demonstration of achievement of the cleanup levels was ensured during the Vertac cleanup activities by performing the activities described in three Project Quality Plans. First, demonstration of achieving the cleanup levels during the remediation of the Off-Site Areas OU, was conducted under the "Remedial Action Sampling and Analysis Plan", prepared by ERM, and dated July 29, 1994. Second, demonstration of achievement of cleanup levels for all other work (except groundwater) was assured by the "Remedial Action Sampling and Analysis Plan", prepared by ERM, and dated May 8, 1997. Third, demonstration of achievement of cleanup levels was ensured for work conducted under OU3 by the Sampling and Analysis Plan (SAP), prepared by Randall Maud, dated June 27, 1997.

These plans provided a system by which general areas of contamination could be identified and a procedure to confirm that affected material had met the performance standards. However, for the purposes of documenting completion of site remediation, five reports were prepared due to numerous Operable Units and UAOs. These reports are listed below:

- 1) Remedial Action Report for Rocky Branch Creek Floodplain Soils (dated July 1998)
- 2) Remedial Action Report for the Jacksonville Residential Areas Superfund Site (dated July 1998)
- 3) Certification of Completion of Disposal Activities Report for the Northern Area Incinerator Facility (dated July 1998)
- 4) Remedial Action Report for OU1 and OU2 (dated August 1998)
- 5) Hydraulic Demonstration Report for OU3 (dated August 1998)

VI. ACTIVITIES AND SCHEDULE FOR SITE COMPLETION

All site construction activities for all Operable Units have been completed. The remedial action goals for the site were: 1 part per billion TCDD in residential areas; 5 ppb total dioxin in commercial/industrial areas (all areas on-site); and 500 ppm TCB (tetrachlorobenzene) in on-site soils.

The remedial action for the northern portion of the site (Parcel 2) resulted in clean closure since all of the contaminated materials above health based levels were removed or treated and removed from this portion of the site. Therefore, operation and maintenance activities are not required for this portion of the site; and this acreage will be available for beneficial reuse such as a small industrial park or other light industrial or commercial purpose. The remedial actions performed in the residential areas

also resulted in clean closure, and no O&M activities will be necessary for these areas.

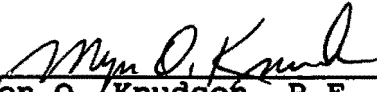
Construction activities for the southern portion of the site (Parcel 1) are complete, but will require O&M activities and long-term groundwater treatment to ensure no site-related groundwater contamination can migrate to a receptor point off-site. Also, institutional controls will be necessary to preclude public access or trespassers indefinitely.

Remaining activities related to OU3 consist of preparing the Remedial Action Completion Report, continuing the groundwater extraction/treatment system and groundwater monitoring program, and conducting operations and maintenance activities. The following table lists remaining activities for complete site close out:

ACTIVITY	FREQUENCY/DATE	STATUS	RESPONSIBILITY
Remedial Action Report OU No. 3		Scheduled for November 1998	EPA
Ground water treatment and monitoring		Initiated	Hercules
Surface water monitoring of Rocky Branch Creek		Initiated	Hercules
Maintenance of caps over burial areas, Mount Vertac, and the new Subtitle C vault.	Continuously	Initiated	Hercules
O&M	Continuously	Has been initiated	Hercules
5-Year Review	Five years	Scheduled for July 2002	EPA
Final Close Out Report		Not scheduled	EPA
Site Deletion		Not scheduled	EPA

VII. FIVE-YEAR REVIEW

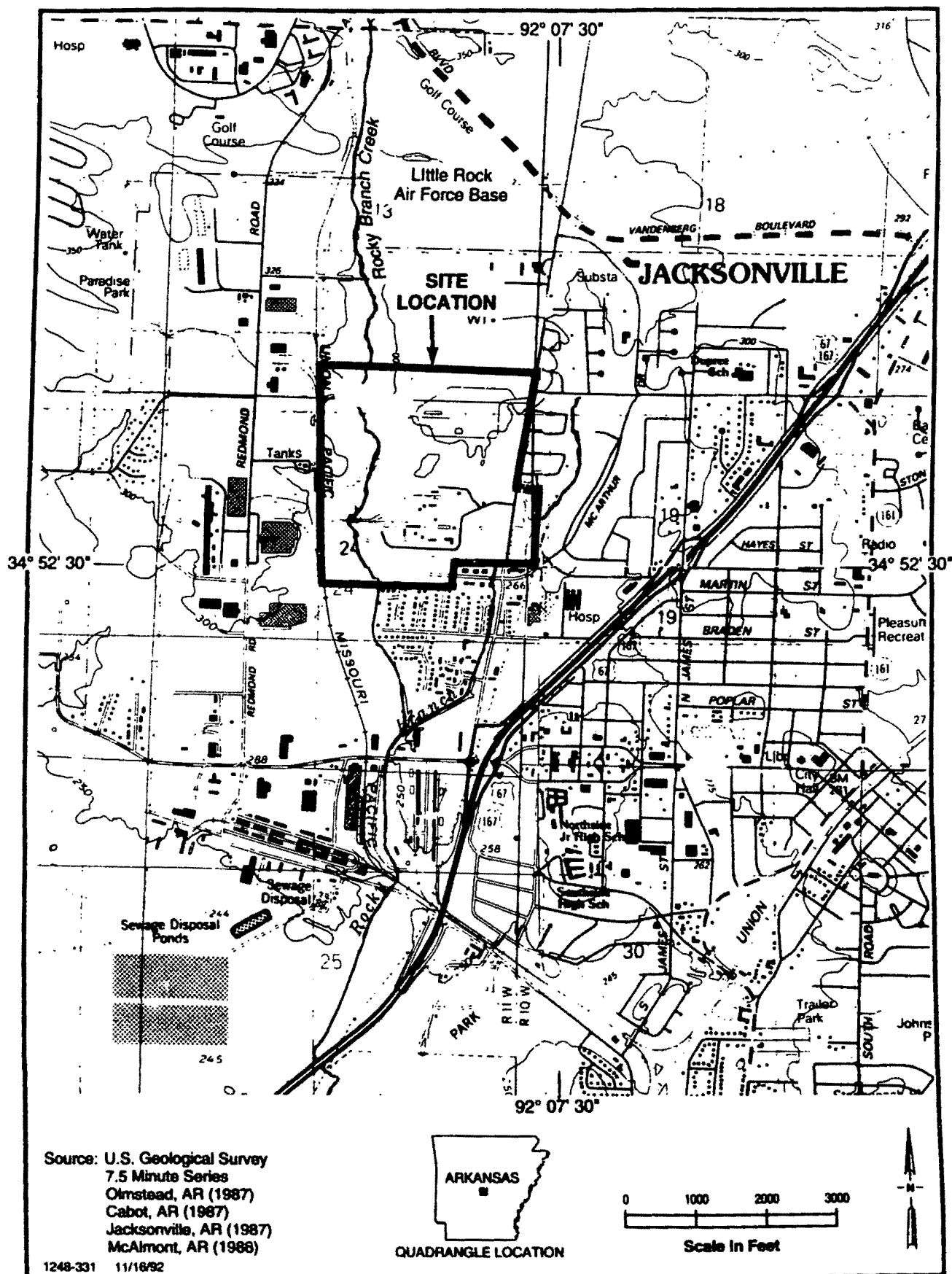
Hazardous substances will remain at the site above health-based levels after the completion of the remedial action. Pursuant to CERCLA Section 121 (c) and as provided in OSWER Directive 9355.7-02, Structure and Components of Five Year Reviews, May 23, 1991, OSWER Directive 9355.7-02A, Supplemental Five Year Review Guidance, July 26, 1994, and Second Supplemental Five Year Review Guidance dated December 21, 1995, EPA must conduct a statutory review. The Five Year Review Report will be completed prior to July 2002, five years after remedial action on-site mobilization.



Myron O. Knudson, P.E.
Director
Superfund Division

8/31/98

Date



**SITE LOCATION MAP, VERTAC SITE
 JACKSONVILLE, ARKANSAS**

Figure 1

Figure 2

